Study of an open loop thermochemical energy storage system based on the $CaO/CaCO_3$ reactive couple

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Thermochemical energy storage is based on gas-solid reactions characterized by high heats of reaction: the endothermic reaction is carried out when excess energy is available (charge phase), while the exothermic reaction is allowed to take place when the energy demand is higher than the production (discharge phase). The efficiency of these storage systems depends on material characteristics, reactor design, and system design. After having analyzed the behavior of the single gas-solid reactors [1-2], the choice of operating conditions must account for the best coupling between the charging and discharging phases as well as with the heat/gas sources. In this work we propose an open loop scheme for thermochemical storage of concentrated solar energy, making use of the waste flue gases as CO_2 source.

References

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